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Prognostication of Blockers Performance on the basis of Anthropometric Characteristics

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Abstract

The objective of the study was to prognosticate blockers performance on the basis of selected anthropometric characteristics. In this study, thirty (n=30) male kabaddi players from Madhya Pradesh were selected who played as blocker position. Age of the subjects was ranging from 17 to 26 years. In this study, Blockers Performance was treated on dependent variable and selected twelve anthropometric characteristics were considered as independent variables. To prognosticate Dependent Variable (Blockers Performance in Kabaddi) on the basis of Independent Variables (Selected Anthropometric Characteristics), multiple regression analysis was used. Results showed that coefficients of regression model for prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric variables, one model is established. The established model is: Blockers Performance = -2.26 +.56* Upper arm length.

Key Words: Blockers Performance, Anthropometric Characteristics.

1. Introduction:

Anthropology deals with the study of man; that is, the study of body and mind and their interrelationships. Anthropometry is the science of measuring the human body and its parts. It is used as an aid to the study of human evolution and variation. Between 1885 and 1900, anthropometric measuring in physical education flourished. Dr. Hitchcock at Amherst and Dr. Sargent at Harvard performed some forty such measures, including age, height, weight, chest girth, and lung capacity, as well as girth and lengths of body appendages. During this period Dr. Sargent published a number of articles, including a manual on the physical measurement of outstanding athletes and norms typifying the physical measurement of the American college man and woman (Mathews, D. K., 1973).

Though Kabaddi is an Indian game, but it is played through the world with different names. The game of Kabaddi is known by several names i.e., Chedu-gudu or Hu-Tu-Tu in southern parts of India, Hadu-du (Men) and Chu-Kit-Kit (Women) in eastern India, and Kabaddi in northern India. In Bangladesh, it is famous with the name hudu-du, gudu in Sri Lanka, chub in Indonesia, Kabaddi in Pakistan and dodo in Nepal. Game of Kabaddi is one of the oldest games of our Indian origin. The game is most ancient. The Indian epic, Mahabharat describes a battle between the warrior Abhimanyu of the Pandavas with the seven Cauravas, inside the enemy camp. He managed to penetrate their seven tiered defence, but died because he did not know the way out. Kabaddi aims to develop the skills of self-defence, attack as well as survival. The rules of the game are very simple. In Kabaddi Game, demands agility, muscular coordination, breath holding capacity, quick responses and a great deal of presence of mind (Kishore, N., 2012).

1.1 Objective of the Study:

The objective of the study was to prognosticate blockers performance on the basis of selected anthropometric characteristics.

2. Methodology:

2.1 Selection of the Subjects:

In this study, thirty male kabaddi players from Madhya Pradesh were selected who play on blocker position. Age of the subjects was ranging from 17 to 26 years.

2.2 Selection of the Variables:

Blockers Performance in Kabaddi was treated as dependent variable and following Anthropometric Characteristics were selected as independent variables:

1) Standing Height, 2) Body Weight, 3) Arm Length, 4) Fore Arm Length, 5) Upper Arm Length, 6) Upper Arm Girths, 7) Hand Length, 8) Leg Length, 9) Thigh Length, 10) Lower Leg Length, 11) Thigh Girth and 12) Calf Girth respectively.

2.3 Statistical Technique Used:

To prognosticate Dependent Variable (Blockers Performance in Kabaddi) on the basis of Independent Variables (Selected Anthropometric Characteristics), multiple regression analysis was used.

3. Results of the Study:

Findings related to Blockers in Anthropometric variables:

Table- 1

Residual Statistics for Blockers Performance in Anthropometric variables

	Minimum	Maximum	Mean	Standard Deviation	N
Predicted Value	16.82	21.31	19.96	1.45	30
Residual	-.31	.68	.00	.34	30
Standardized Predicted Value	-2.15	.92	.00	1.00	30
Standardized Residual	-.89	1.96	.00	.98	30

a. Dependent Variable: Blockers performance

Table- 1 showed the residual statistics for prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric variables.

In this, standardised residual ranges from -.89 to 1.96. This falls in the expected range, so there is no outliers in this study. In table 3, Durbin Watson value of 2.43 justify that there is independence in data point.

Figure- 1

Histogram and Normal probability Plot of residuals for estimating Blockers Performance in Kabaddi on the basis of Anthropometric variables

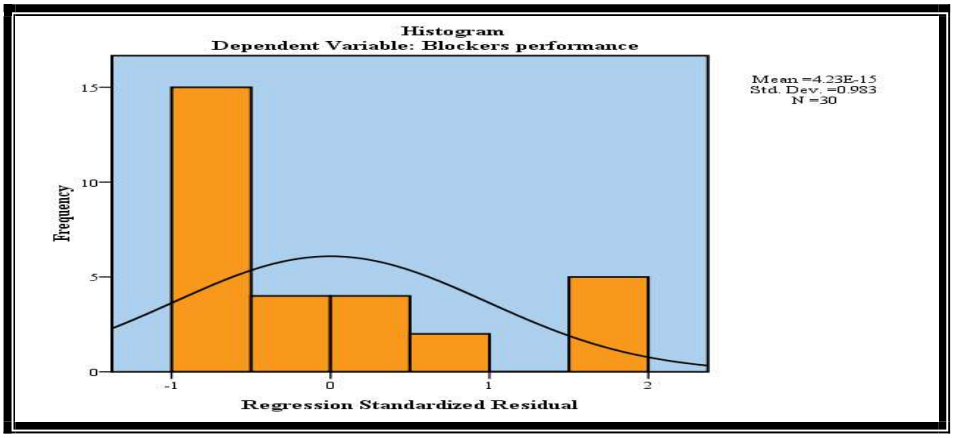

Figure- 1 shows the histogram and normal probability plot of residuals for estimating Blockers Performance in Kabaddi on the basis of Anthropometric variables. Figure shows that normality is present to a great extend regarding the residuals with mean near to zero and standard deviation near to one.

Figure- 2

P-P Plot of residuals for estimating Blockers Performance in Kabaddi on the basis of Anthropometric variables

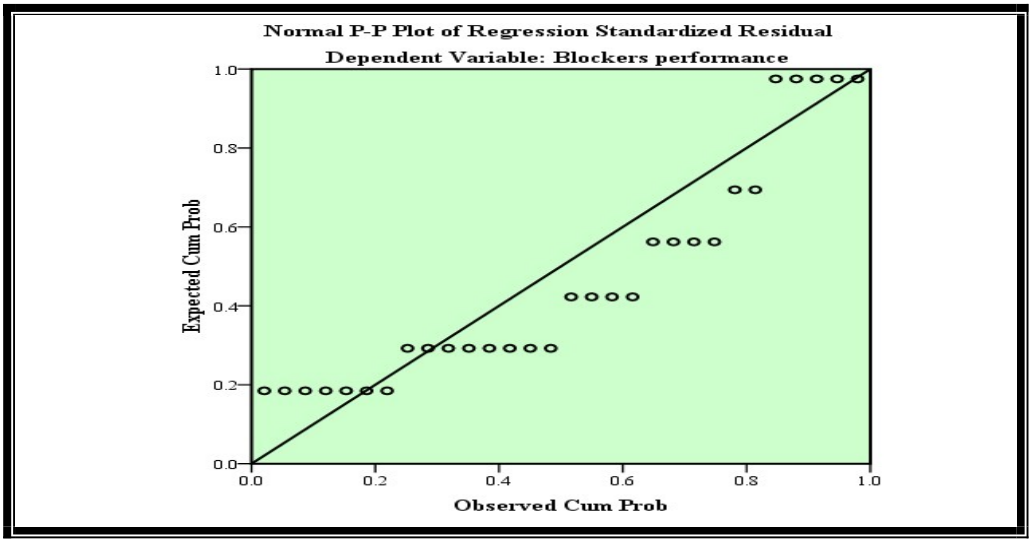

Figure- 2 Shows the P-P plots of residuals for estimating Blockers Performance in Kabaddi on the basis of Anthropometric variables.

Figure shows that observed plots are not near to expected standard line. This shows that distribution of residuals is not exactly normal.

Figure- 3

Scatter Plot for estimating Blockers Performance in Kabaddi on the basis of Anthropometric variables for constant variance

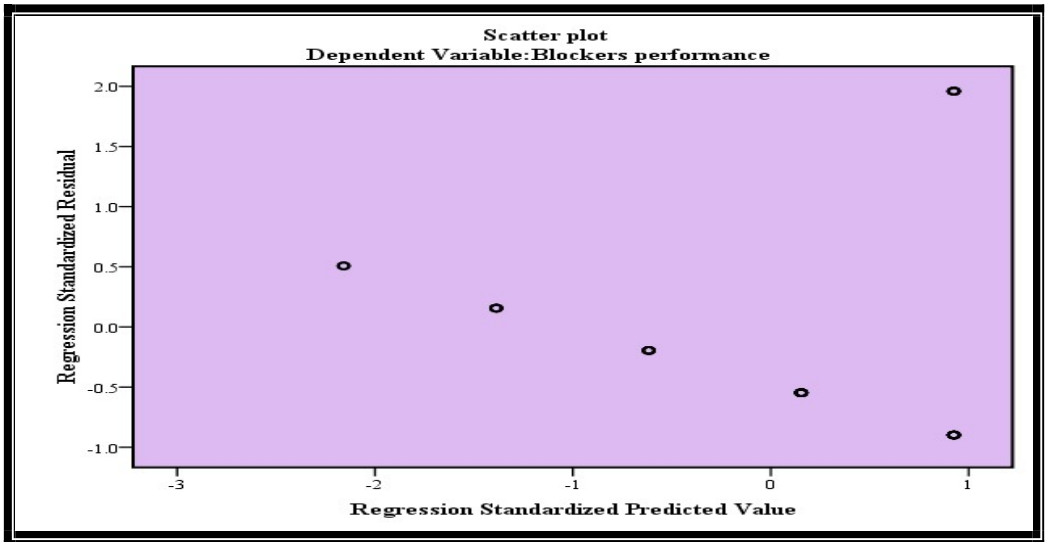

Figure- 3 showed scatter plot for prognosticating Blockers performance in Kabaddi on the basis of Anthropometric variables. Figure shows the constant variance is not fulfilled.

Since assumptions are partially fulfilled to apply multiple regression model, established model may be generalized to prognosticate Blockers Performance on the basis of Anthropometric variables.

Table- 2
Descriptive Statistics of Blockers Performance and Anthropometric variables

Measures	Mean		Standard Deviation	Skewness		Kurtosis	
	Statistic	Standard Error	Statistic	Statistic	Standard Error	Statistic	Standard Error
Blockers performance	19.96	.27	1.49	-.40	.42	-.70	.83
Standing height	170.56	1.02	5.59	-.10	.42	-1.50	.83
Body weight	72.23	1.04	5.71	-.63	.42	-.84	.83
Arm length	86.63	1.59	8.75	-1.07	.42	-.84	.83
Fore arm length	49.18	1.02	5.59	-.55	.42	-.70	.83
Upper arm length	39.60	.47	2.59	-.82	.42	-.46	.83
Upper arm girth	31.79	.20	1.09	-.21	.42	-.64	.83
Hand length	20.86	.23	1.29	-.93	.42	-.32	.83
Leg length	103.33	1.28	7.04	-.02	.42	-1.95	.83
Thigh length	50.86	.59	3.27	-.10	.42	-1.44	.83
Lower leg length	52.46	.73	4.04	-.02	.42	-1.80	.83
Thigh girth	49.58	1.09	5.99	-.43	.42	-.85	.83
Calf girth	38.05	.97	5.35	.53	.42	.37	.83

Table- 2 shows the descriptive statistics of Blockers performance and Anthropometric variables.

In Blockers performance obtained mean, standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 19.96, .27, 1.49, -.40, .42, -.70 and .83 respectively.

In Standing height obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 170.56, 1.02, 5.59, -.10, .42, -1.50 and .83 respectively.

In Body weight obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 72.23, 1.04., 5.71, -.63, .42, -.84 and .83 respectively.

In Arm length obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 86.83, 1.59, 8.75, .-1.07, .42, -.84 and .83 respectively.

In Fore arm length obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 49.18, 1.02, 5.59, -.55, .42, -.70 and .83 respectively.

In Upper arm length obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 39.60, .47, 2.59, -.82, .42, -.46 and .83 respectively.

In Upper arm girth obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 31.79, .20, 1.06, - .21, .42, -.64 and .83 respectively.

In Hand length obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 20.80, .23, 1.29, -.82, .42, -.46 and .83 respectively.

In Leg length obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 103.33., 1.28, 7.04, - .02, .42, -1.95 and .83 respectively.

In Thigh length obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 50.86, .59, 3.27, - .10, .42, -1.44 and .83 respectively.

In Lower leg length obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 52.46, .73, 4.04, -.02, .42, -1.80 and .83 respectively.

In Thigh girth obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 59.58, 1.09, 5.99, - .43, .42, -.85 and .83 respectively.

In Calf girth obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 38.05, .97, 5.35, .53, .42, .37 and .83 respectively.

Table- 3

Model Summary related to prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric variables

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate	Durbin-Watson
1	.973[a]	.94	.94	.34	2.43
a. Predictors: (Constant), Upper arm length					
b. Dependent Variable: Blockers performance					

Table- 3 showed the model summary for prognostication of Blockers Performance in Kabaddi on the basis of Anthropometric variables. One model was established by multiple regression analysis.

In this model, R of .97 is the relationship between independent variables (Upper arm length) and dependent variable (Blockers Performance in Kabaddi). Adjusted R square of .94 justify that 94% of Blockers Performance in explained by Upper arm length.

Table- 4

ANOVA Table for prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric Variables

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	**Regression**	61.53	1	61.53		
	Residual	3.42	28	.12	502.50	.000[a]
	Total	64.96	29			
a. Predictors: (Constant), Upper arm length						
b. Dependent Variable: Blockers performance						

Table- 4 of ANOVA is related to the utility of one established model.

In model, F. Value of 502.50 is significant at .05 level, this model is found effective is prognosticating Blockers Performance in Kabaddi on the basis of Upper arm length.

Table- 5

Coefficients of Regression Model for prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric variables

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Standard Error	Beta	t	Sig.
1	**(Constant)**	-2.26	.99		-2.28	.030
	Upper arm length	.56	.02	.97	22.41	.000
a. Dependent Variable: Blockers performance						

Table- 5 shows the coefficients of regression model for prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric variables**.** On The basis of table 5 established models is:

Model : Blockers Performance = -2.26 +.56* Upper arm length

Table- 6

Details of Excluded Variables for prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric variables

Model		Beta In	T	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	**Standing height**	.033[a]	.742	.465	.141	.980
	Body weight	.019[a]	.414	.682	.079	.969
	Arm length	-.007[a]	-.148	.883	-.028	.948
	Fore arm length	-.020[a]	-.444	.661	-.085	.973
	Upper arm girth	-.012[a]	-.250	.805	-.048	.919
	Hand length	-.031[a]	-.196	.846	-.038	.077
	Leg length	.061[a]	1.424	.166	.264	.999
	Thigh length	.055[a]	1.271	.215	.238	1.000
	Lower leg length	.062[a]	1.445	.160	.268	.996
	Thigh girth	-.022[a]	-.490	.628	-.094	.962
	Calf girth	.005[a]	.105	.917	.020	.925

a. Predictors in the Model: (Constant), upper arm length

b. Dependent Variable: Blockers performance

Table- 6 shows the details of excluded variables for prognosticating Blockers Performance in Kabaddi on the basis of Anthropometric variables.

In this model, eleven Anthropometric variables were excluded (Standing height, Body weight, Arm length, Fore arm length, Upper arm girth, Hand length, Leg length, Thigh length, Lower leg length, Thigh girth & Calf girth).

4. References:

[1]. Best, J.W. (1963). Research in education. U.S.A.: Prentice Hall.
[2]. Chan, Y. H. (2003). Biostatistics 101: Data presentation. Singapore medicine journal, 44 (6), 280-285.
[3]. Chan, Y. H. (2003). Biostatistics 104: correlational Analysis. Singapore medicine journal, 44 (12): 614-619.
[4]. Chan, Y. H. (2004). Biostatistics 201: linear Regression Analysis. Singapore medicine journal, 44 (2): 55.
[5]. Clark, H. H., & Clark, D. H. (1975). Research process in physical education. Englewood cliffs, New Jersey: Prentice Hall, Inc.
[6]. Field, A. (2009). Discovering statistics using SPSS. London: SAGE Publications Ltd.
[7]. Gay, L.R. (2000). Educational research.U.S.A: Prentice Hall.
[8]. Gupta, S. L. & Gupta, H. (2011). SPSS for researchers. New Delhi: international Book House Pvt. Ltd.
[9]. Kishore, N. (2012). How to play Kabaddi. Delhi: Prerna Prakashan.
[10]. Landau, S. & Everitt, B. S. (2004). A handbook of statistical analysis using SPSS. New York: Chapman & Hall/CRC Press LLC.
[11]. Mathews, D. K., (1973). Measurement in physical education. Toronto: W. B. Saunders Company.
[12]. Sa, J. P. M. D. (2007). Applied statistics using SPSS, STATISTICA, MATLAB and R. New York: Library of Congress.
[13]. Verma, J. P. (2000). A text book on sports statistics. Gwalior: Venus Publications

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